
CHAPTER FOURTEEN IMPLEMENTING THE CCMP

The previous chapter considered eight management issues identified by GBNEP's Management Committee. This short chapter considers the problem of managing the bay in a different way, using an analysis that focuses on (nonmonetary) resources and impediments rather than the components of the regulatory process. After a review of the resources and barriers to coordinated bay environmental management, we consider several possible institutional arrangements for providing coordinated management of the bay and implementing the CCMP and offer some comments about data management, an integral component of coordinated management for any purpose. This discussion concludes our assessment of the present programs and takes us towards the future.

RESOURCES

In managing a complex public resource such as the environment of Galveston Bay, authorities need all the help they can get. This section briefly considers three possible resources that deserve further attention. As we noted in our discussion of environmental planning, people are more likely to accept and support a plan if they have been part of formulating it, not least because the plan will then take into account their own goals and interests. Thus it behooves planners to bring them into the process as early as possible.

In addition to the resources mentioned here, we would be remiss if we failed to mention the business community. We have noted several activities they are undertaking, including an effort to develop a wetlands mitigation bank and spill response teams and equipment. Several local industries jointly fund a major air quality monitoring program and are developing a water quality monitoring program as well. Because industry is often most directly affected by proposed environmental quality programs and because they also have resources that can supplement those available in the private sector, this important group must also be a part of the planning process from the outset.

Citizen Groups

The Galveston Bay area is blessed with scores of citizen groups concerned with a variety of environmental issues, ranging from a particular neighborhood beach to the health of the bay as a whole. A recent guide to groups in the Houston area concerned with the environment includes more than 100, not including professional and scientific groups (Texas Environmental Center, 1991). The energy and expertise of these groups, as well as of unorganized individuals, constitutes an important resource in planning to manage the bay. The growing program for citizen monitoring of the bay is an excellent example of the way in which the public can supplement the limited resources of government. Groups focused on specific issues or with a well-defined membership offer an opportunity

for targeted public education; for example, a boat-owners group could help inform its membership about proper disposal of boat wastes, fishing laws, and the importance of wetlands preservation.

Following is a brief description of a few of the most active groups promoting environmental management of Galveston Bay we encountered in the course of our research:

Galveston Bay Foundation (here, GBF). Founded by environmental attorney Jim Blackburn, GBF is modeled after a similar program for Chesapeake Bay. GBF is a non-profit organization which is dedicated to preservation and enhancement of the multiple uses of the bay. The Foundation has a varied membership including the following interests: sport fishing, commercial fishing, government, recreational interests, environmental organizations, shipping, and business and development interests. GBF has four goals: 1) education, 2) conservation, 3) research, and 4) advocacy. Meetings, conferences and bay-oriented courses for adults and children are offered to educate citizens about Galveston Bay. GBF has sponsored planting cypress trees in the Trinity River Delta, created smooth cordgrass wetlands in the San Jacinto River, and financed bay-related research projects. In its role as an advocate, GBF seeks to mediate between the often conflicting users of the Bay. Before the company withdrew from the area, GBF had come close to negotiating an agreement with Texas Copper to limit their effluent.

Galveston Bay Conservation-Preservation Association (GBCPA). GBCPA was established in the mid-1970s by a group of local homeowners concerned about continued degradation of the Bay. GBCPA's first action was to oppose a proposal by the Army Corps of Engineers to build a levee from Morgan's Point to the Houston Yacht Club. Since then, GBCPA has been active in many environmental/development conflicts. For example, GBCPA contested Texas Copper's application. Working with other groups against Texas Copper, GBCPA helped form Bay Watch, a new environmental organization.

Houston Audubon Society (HAS). The primary purposes of the Houston Audubon Society are habitat preservation, acquisition of land, and environmental education. HAS purchases land that developers see as profitable and turns the coveted land into sanctuaries. The bird sanctuary at High Island is one example. HAS is currently involved in several negotiations with government and private developers. HAS also leases land from the GLO for bird sanctuaries; this program is discussed in chapter 10 on species protection. Among current concerns are the Corps of Engineers' Wallisville Dam Project, which HAS believes jeopardizes the salinity level of Galveston Bay, and the City of Houston's Westside Airport proposal, which it believes endangers bald eagles and scarce wetlands. Just recently, the City of Houston proposed the dismantling of the Bureau of Air Quality Control. HAS was instrumental in organizing 15 interest groups and successfully lobbying against the disassembling of the Bureau. In 1989, HAS was responsible for creating and implementing a Christmas Tree Recycling program which the City now organizes and maintains.

We also mentioned the Clean Houston Task Force and Buffalo Bayou Coalition in our consideration of nonpoint sources.

Other groups form around particular issues, often disbanding when the issue is resolved. For example, neighbors and the Armand Nature Bayou Center came together as an interest group and fought the construction of a road through Armand Bayou Park. The parties were able to reach a compromise which allowed the road to be constructed but would have minimal effects on the park. These groups are more difficult to find and work with, but their concern offers an excellent opportunity to help them see that their problem is but one example of a much broader concern about the preservation of Galveston Bay.

There are also, of course, groups whose priorities sometimes will conflict with environmental protection of the bay; among them are the several Chambers of Commerce, the Texas Chemical Council, and the National Association of Home Builders. The various commercial fishermen's organizations may have mixed reactions to GBNEP goals: on the one hand, environmental quality is necessary to ensure continued availability of the seafood resources they exploit; on the other hand, they often oppose governmental intervention to limit their own activities. Working with these groups is no less important than working with more compatible groups, although the nature of the interaction may be different. These groups can mobilize powerful resources to undermine any plan they oppose, including persuading the public that they stand to lose jobs and income from a comprehensive bay management plan. Therefore, it is crucial that they participate in formulating the plan.

Under the agreement between EPA and TWC establishing the program, GBNEP has a public participation committee. Its membership includes representatives of several environmental groups and large and small businesses related to the bay as well as unaffiliated citizens who have been active in the bay area. GBNEP also has an active public outreach component. Including all these groups is a good start towards obtaining the public support that will be necessary to make the CCMP more than a paper document.

River Authorities

Texas is unique among states in having established a set of independent river authorities, recognizing that upstream and downstream users live in mutual dependence. The Trinity and San Jacinto River Authorities are political divisions of the state of Texas created under Article XVI, Section 59 of the Texas Constitution. The San Jacinto River Authority (SJRA) was created by legislature in 1937 to conserve, control, and beneficially utilize storm and flood waters. The Trinity River Authority (TRA) was created in 1955. Both river authorities are responsible for surface impoundments in their respective watersheds and undertake water quality programs. Under Senate Bill 818, passed by the Texas legislature in 1991, both SJRA and TRA would assume greater roles in water quality protection.

SJRA owns and operates Lake Conroe and the regional water and wastewater facilities for the Woodlands, a Montgomery County community consisting of nine utility districts and approximately 31,000 people (Texas Water Conservation Association, 1991). Current water quality activities include self-reporting monitoring of the wastewater treatment plant effluent and water quality in Lake Conroe. The United States Geological Survey (USGS) performs monitoring of Lake Conroe in conjunction with SJRA.

In coordination with the City of Houston, the Gulf Coast Waste Disposal Authority, and the Houston-Galveston Area Council (HGAC), SJRA will participate in the watershed assessment of the San Jacinto River Basin mandated under SB 818. Funding for the assessment will be provided by TWC, which will obtain fees by assessing water users and wastewater permit holders in the watershed in proportion to their rights.

The Trinity River Authority's activities include wastewater treatment, water treatment and supply, distribution of water for irrigation, water storage, and water quality management. TRA owns and operates four wastewater treatment facilities which have a capacity of about 150 million gallons per day as well as Lake Livingston and several water treatment and supply systems. On Lake Livingston, TRA has contracted with USGS to sample and analyze lake and stream quality around the lake and to use an automated continuous water quality monitor on the river entering the lake (Texas Water Conservation Association, 1991). TRA is also one of the sponsors of the Wallisville project and releases up to 1,000 cfs of water from Lake Livingston to prevent saltwater intrusion. The agency conducts data collection and modeling and is a supporting partner with the Soil Conservation Service for federal funds. TRA conducts its own monitoring and contracts for research on the river.

Senate Bill 818, which mandates a watershed approach to water quality, presents the river authorities with both an opportunity and a quandary. On the one hand, they may be called upon to enforce water quality regulations—a conflict of interest as both SJRA and TRA are wastewater permittees. Similarly, both agencies obtain funding primarily from water sales and sewage treatment; raising their fees to support increased environmental activities would put them at a competitive disadvantage. Although SB 818 does provide some funding for the river authorities, the new responsibilities may be much greater than the available funds.

On the other hand, the river authorities are now provided with the authority to implement activities on a watershed-wide basis. Rather than merely balancing conflicting demands for water in their river basins, the authorities could work with TWC to take proactive steps to manage both the quality and the quantity of water. In this sense, the SJRA and the TRA are resources for GBNEP. They are also resources because they are familiar with their own areas and have long experience with both the similarities and differences among the several counties they cover. Below we shall suggest that strengthening ties with local governments is a major task for GBNEP; river authorities offer one path for achieving this goal.

Local Governments

We place local governments last in our discussion of untapped resources, closest to the obstacles, because they could fall into either category. Our discussion in chapter 8 suggests that economic development tends to be a higher priority than environmental protection, in part because small local governments are often unaware of their increasing environmental responsibilities (managing stormwater quality, for example) and the attendant costs. We also noted that county commissioners tend to be uninterested in environmental issues surrounding septic tanks. Table 14-1 summarizes information about sixteen cities in the Galveston Bay area.

Table 14-1
Cities Near Galveston Bay

City	Form	Inc.	Council/ Term	Familiar w/GBNEP? *
Alvin	CM	Y	7/3yrs	N
Anahuac	MC	Y	5/2yrs	N
Angleton	CM	Y	5/2yrs	N
Baytown	CM	Y	6/1-2yrs	N
Deer Park	CM	Y	6/2yrs	N
Dickinson	MC	Y	6/2yrs	Y
Friendswood	CM	Y	6/3yrs	Y
Galveston	CM	Y	6/3yrs	Y
Hitchcock	CoM	Y	4/2yrs	N
Houston	MC	Y	14/2yrs	N
Kemah	MC	Y	5/2yrs	Y
La Porte	CM	Y	8/3yrs	Y
La Marque	CM	Y	4/1-2yrs	N
League City	MC	Y	5/2yrs	Y
Pasadena	MC	Y	6/2yrs	N
Texas City	CO	Y	6/yrs	N

Source: Compiled by authors from interviews.

CM=City Manager/Council MC=Mayor/Council CO=Commission
CoM=Commission and Mayor. Some cities include the mayor in the count
of council members. Inc=Incorporated? Number on city council/length
of term.

*Answer to question, "Have you ever heard of the Galveston Bay National
Estuary Program?" (We may have erred in some cases by saying
"GBNEP" instead; thus the number of "no's" may be high.)

Nevertheless, we see local governments as a resource for GBNEP. Cities and counties offer important benefits: closeness to citizens, awareness of their particular concerns and problems, neighborliness—in short, an immediacy and salience that larger units of government seldom command. These are precisely the characteristics of government that enhance success in public education campaigns and in bringing together contending interests for resolution of environmental issues.

Unfortunately, we believe that local governments are not yet fully aware of the Galveston Bay National Estuary Program. Table 14-1 reflects this problem, although we are hesitant to rectify the results because they came from an interview with only one staff person in each city—people who said they could speak for the elected officials but in fact may not have been aware of their knowledge of GBNEP. However, other interviews with local elected officials and staff suggest widespread ignorance of the program. If they don't know about it, they cannot support it; worse, when the CCMP is finally developed, they could see it as another plan from the top whose net effect is to burden local governments still more, and they could resist it. The Local Government Advisory Committee of GBNEP has been slow in formation and generally poor in attendance. But even one or two active members from each county will not ensure that relevant local government employees or other small towns will know about the program, much less embrace it enthusiastically. Citizens in the various groups who are working with GBNEP must talk to their local officials, and other local officials must also be mobilized to talk to their counterparts. Although time-consuming, contacting local elected officials and their staffs will more than pay off in the end.

OBSTACLES

It is, predictably, easier to identify obstacles to coordinated environmental management of Galveston Bay than it is to identify resources. Here we review a few obstacles that have become especially clear in the course of our study, excluding information management, which is considered separately below:

- Absence of information in a form compelling to the public. People will respond, even with lifestyle changes, if a problem is described in a graphic and convincing way. As noted, we had hoped that the introductions to our chapters on the action plan topics would constitute such descriptions. However, we found it difficult if not impossible to obtain the necessary information: acres of wetlands lost, miles of shoreline transformed from public to private access, increase in fishable waters, etc. Gaining the public's interest and support is much like running an advertising campaign—if you cannot convey the issue in less than a paragraph, there isn't much hope. While we may deplore this situation, we must learn to work within it. Global warming, a complex technical problem, has become a real public concern in part because it could be summarized in a two-word phrase.
- A political climate generally unfavorable to government and coordinated government action, especially if it appears to conflict with individual needs. This political climate can perhaps best be described as lack of understanding that some resources are inherently public. Ownership implies a positive right to hold the

object and a negative right to exclude others from its use. No one else has a right to the ice cream cone I have purchased. Common property has a definite set of users with rights and duties: water rights holders may have a certain amount of water but must not exceed it, lest they infringe on the rights of others. But these two categories do not exhaust all the possibilities: what about "commons," such as open fisheries where no one has a right to a particular fish nor even to a certain amount of fish, and there is no correlate duty on anyone not to fish (Stevenson, 1991)? Common property usually requires some authority to mediate among property owners and help enforce their mutual rights and duties; commons either deteriorate to the disadvantage of all (are overfished, for example) or are subject to public oversight. Environmental resources tend to fall into the last category. Yet because land, shoreline, and dunes can be purchased, people often think of them as falling into the first category, and they behave accordingly without reference to larger public goals. There are theories, presently unpopular, which argue that there is even a public basis to private ownership and that even private property carries duties to the larger society.

In the case of land use, the public distrust of government is reflected in a growing movement to regard all environmental regulation, especially the Endangered Species Act and shoreline development restrictions, as a "taking" of private property. As noted in Chapter 8, in June 1992, the Supreme Court decided *Lucas v. South Carolina Coastal Council*, holding that environmental regulations, no matter what their public benefits, do not necessarily justify the state from limiting a person's use of his (coastal) property. Although this decision did not go as far as some people expected, it continues to cement a policy that individual property rights are very strong even with respect to the public benefits of environmental regulations.

In addition to causing people to reject the public nature of some natural resources, growing public discontent with government has another serious effect—it exacerbates problems of low pay and staff turnover. When government cannot perform up to the public's expectations, people (and, especially, their legislators) tend to provide less, not more money. As we have seen, however, much of the reason for any poor performance in protecting the environment of Galveston Bay can be tied to limitations on resources, especially inadequate staffing and low pay which increases turnover. Breaking this destructive cycle will be difficult in an era of tight budgets.

- Relative ease of regulating a small number of centralized actors compared to regulating a large number of decentralized actors. This problem is not unique to Galveston Bay or even environmental regulation; it characterizes all forms of activity. But it is particularly important now because in many cases we have reached the point of having addressed all the centralized or readily-defined problems (point source, coastal barrier islands) and must now turn to problems caused in a much more diffuse way: pesticide use, subsidence, nonpoint source pollution. Thus success in maintaining or improving the bay's environment means working with virtually all of the millions of people residing in the metropolitan area—an expensive and daunting task.

The federal and, often, state response to these diffused problems is to delegate responsibility to units of government closer to the individuals involved. Unfortunately, as we have seen, local governments' capacities to shoulder these new responsibilities are small. Indeed, we are witnessing a reaction among city and county governments who simply refuse to undertake new mandated tasks, even at the cost of losing a grant or two. These governments simply cannot find money or staff to fulfill their obligations.

Virtually the only answer to this problem is to devise alternative regulatory methods that rely on the market to elicit desired environmentally-sound behaviors. In so doing, however, we must be sure to think carefully about all the ramifications of our proposals, so that we do not inadvertently give people incentives to take actions in conflict to the desired outcome.

- **Contradictory agency mandates.** The summary pages for each action plan topic show that in many if not most cases, agencies have multiple mandates that often conflict. Thus in fulfilling one mandate, the agency may hurt another. For example, the Texas Water Development Board's goal is "water for Texas." One correlate goal is protecting the environment, but it is clear that ensuring adequate water for human needs is the real concern of the agency. Similarly, the Army Corps of Engineers considers multiple goals, including wetlands protection for water quality maintenance, in assessing dredge and fill permits. But the Corps' primary purpose is building and maintaining various waterways, including the various ship channels and the Intracoastal Waterway. No matter how fair the process, the ultimate purpose of the permits is to allow, even encourage, human activity, not defend wetlands.

The result of these conflicting mandates is that each agency's policies properly reflect its efforts to balance concerns about the environment against economic stability or growth. However, when the agencies then meet to develop joint policies or resolve differences, there is no voice speaking unequivocally for the environment. Thus the balance subtly but inevitably tilts away from firm protection of environmental resources.

The balancing thus makes public policy—a kind of decision that our form of government tries to reserve to the legislative rather than the executive branch. Put another way, ever since the demise of the Atomic Energy Commission, which was established to promote and regulate the nuclear power industry, students of public management have recognized that it seldom works to leave the fox guarding the henhouse. Our comment in chapter 13 about the importance of particular individuals takes on clearer importance in this context, as we recognize that each permit writer or enforcement officer balances conflicting mandates in his or her own mind and takes action accordingly.

Thus we believe that ultimately Texas will want an agency whose primary goal is environmental protection, rather than multiple agencies with multiple overlapping and conflicting mandates. Similarly, we believe a clear statutory mandate for protecting wetlands and other habitats will overcome existing problems in a way that no inter-agency councils can do. In the meantime,

however, agencies must make explicit the ways in which they are balancing their conflicting mandates, and the legislature must offer guidance to agencies in assigning priorities among the diverse goals.

Conclusion

In this brief discussion of obstacles, we have not considered fragmented regulatory authorities. We believe this point has been made ad nauseum in the chapters on the action plan topics. Instead, we have highlighted four topics that are less frequently considered but have important effects on any effort to manage the bay in a coordinated manner. The following section considers possible institutions for overcoming fragmentation and putting the CCMP into action. One criterion for evaluating these different institutional arrangements is the extent to which they might overcome at least some of the obstacles.

INSTITUTIONS FOR MANAGING GALVESTON BAY

There are several ways in which the scores of agencies described in the preceding chapters can work together to manage Galveston Bay's environment in a coordinated manner. Texas has long been fond of interagency coordinating councils; unfortunately, they usually have little authority and often become forums for debate or learning what your rival is doing rather than means of coordination. The following list does not begin to exhaust the possible institutional arrangements for implementing the CCMP, which is due to be completed in September 1994; we list here only those most likely or most frequently mentioned in our discussions with bay watchers.

1. **Existing GBNEP.** The National Estuary Program mandates that each estuary of national significance shall establish a rather complex governing mechanism to develop the CCMP. A Policy Committee appointed by the governor is supported by a Management Committee (representatives of affected federal, state, local, and regional agencies); a Science and Technical Advisory Committee; a Citizens Advisory Steering Committee; and a Local Government Advisory Committee. Each of the supporting committees plays a particular role in developing the CCMP, which is ultimately adopted by the Policy Committee. This framework could remain for implementing the CCMP.

EPA has indicated that it will consider allowing an "implementation committee" similar to GBNEP to administer the CCMP (Coastlines, March-April 1992, p. 2). However, thus far no National Estuary Program has chosen such a mechanism.

Advantages

Already in place

People, agencies working together already

People will know each other

Familiar with all aspects of CCMP

Disadvantages

- No financial power independent of existing governments; dependent on handouts
- No regulatory power independent of existing agencies; dependent on their concern
- No means for resolving agency conflicts except negotiation
- No means for resolving conflicts among multiple mandates except good will
- Difficulties in receiving funds: presently all channeled through TWC, of which program is a part
- Relies heavily on contributed time of agency representatives and citizens

2. Coastal Coordination Council. The CCC was established in 1991 as part of Texas' effort to join the Federal Coastal Zone Management Program. Under the state law establishing the council, all state, local, and individual projects on state-owned lands (wetlands and shore up to mean high tide) must be consistent with the coastal management plan presently under development. When Texas is accepted in the CZMP, federal projects will also have to be consistent with the plan. If Texas' CZMP is approved, Galveston Bay is likely to be designated a "Special Management Area," which offers additional power to coordinate and control a large coastal ecosystem. Thus the CCC will play some role in managing the bay under any circumstances. Here we are suggesting that the CCC could become the primary implementing entity for Galveston Bay's CCMP, either as part of its present mandate to coordinate coastal projects or by legislative action designating the CCC as the institution for implementing the CCMP.

Advantages

- Already in place
- Agencies working together already
- Power to disallow actions not consistent with the coastal plan (CCMP would have to be consistent too)

Disadvantages

- Very few agencies represented
- No mechanism for ensuring public involvement
- No financial power independent of existing governments; dependent on handouts
- No means for resolving conflicts among multiple mandates except good will
- If Texas not accepted for federal CZM, federal projects uncontrolled

3. Single existing agency. A single existing agency, probably the Texas Water Commission, but possibly the General Land Office, could be designated to implement the CCMP. Once the agency is selected, it would remain to be determined how the implementation would fit into the existing organization: GBNEP is in TWC but is an unusual program in that it is governed by a body (the Policy Committee) outside the agency. Would this mechanism be continued? Should the program be managed at a Houston or Galveston district office to allow people most closely involved to attend meetings more easily? At present, considerable funds are expended either in getting Austin-based government staff to the Houston area or vice versa.

Advantages

Already in place (if TWC district office is entity)

Regulatory power

Financial resources

Disadvantages

Only one agency—how coordinate? Other agencies jealous?

No Texas agency has power over all the areas that need to be managed

No mechanism for ensuring public involvement

No means for resolving conflicts among multiple mandates except good will

4. Non-governmental entity. The Legislature could designate an existing nongovernmental entity such as the Galveston Bay Foundation as a quasi-governmental entity for implementing the CCMP. The Chesapeake Bay Foundation serves in such a capacity.

Advantages

Already in place

People, agencies working together already

Strong involvement with nongovernmental groups

Familiar with all aspects of CCMP

Strongly committed to comprehensive bay management

Disadvantages

No financial power unless granted by Legislature

No regulatory power independent of existing agencies; dependent on their concern

No means for resolving agency conflicts except negotiation

No means for resolving conflicts among multiple mandates except good will

Jealousy from agencies and other groups (?) Perceived bias (?)

5. Regional Authority. Texas has the means to create a variety of special districts and regional authorities. Above we described the river authorities, and in chapter 3 we discussed Municipal Utility Districts (MUDs) and other independent utility districts, of which there are more than 550 in the 5-county area. These can be created by the legislature or by TWC, and have a wide latitude of allowed activities. Other special districts we have discussed include the Houston-Galveston Coastal Subsidence District, the Harris County Flood Control District, and the Gulf Coast Waste Disposal Authority, created by the legislature. The first of these issues permits, while the latter even has bonding authority. Thus there is little doubt that the legislature could create a regional authority or special district with at least some of the authorities necessary to coordinate management of the bay. However, such authorities would not supersede the powers already vested in existing agencies, such as regulation of water quality or ability to comment on dredge and fill permits.

In Washington, this problem was resolved when the state legislature created the Puget Sound Water Quality Authority to implement the CCMP. In creating it, the legislature said:

The large number of governmental entities that now affect the water quality of Puget Sound have diverse interests and limited jurisdictions which cannot adequately address the cumulative, wide-ranging impacts which contribute to the degradation of Puget Sound. It is therefore the policy of the state of Washington to create a single entity with adequate resources to develop a comprehensive plan for water quality protection in Puget Sound to be implemented by existing state and local governments.

Washington created a new entity with financing and the power to ensure that other agencies' actions are consistent with the Puget Sound Plan. It would also be possible to create a new agency with full regulatory powers, although politically this would be very difficult, especially since agencies losing some power to the new entity would include those with elected heads. The Washington solution also has the advantage of avoiding problems associated with taking regulatory authority from an agency only for a particular geographic region: how could anyone do water rights planning for a watershed of which part was under a Galveston Bay Authority and part was not?

Advantages

Financial power

Regulatory power

Enforce coordination among agencies

A single mandate: protect the bay

Disadvantages

New—startup costs

Unlikely for Legislature to establish another new agency (?)

Other agencies jealous, uncooperative (?)

No known track record with citizens groups

Perhaps the most important development in environmental policy in the last five years is the growing recognition that problems must be addressed in a holistic manner, rather than disaggregating them among media (air, water), kinds of problems (toxics), or specific human activities (construction, dredge and fill). Here, as so often, scientific and even popular understanding is well ahead of the regulatory framework. The challenge, therefore, is to devise institutions that can work within the existing framework, coordinating among many different laws and agencies, as well as respond when the laws change to reflect a broader ecological perspective. In Texas, where authority is more than usually fragmented, we think the primary consideration is developing a mechanism that can ensure consistency among agency actions without detracting from their individual authorities. The regional authority or CCC models best meet this paramount need.

INFORMATION MANAGEMENT AND COORDINATION

In our discussion of monitoring, we noted some problems with data, including compatibility and reliability. In this section, we briefly consider the role of information management more generally in facilitating and especially coordinating environmental protection of Galveston Bay. This is not intended to be a complete discussion of all information needs or uses for managing the bay, but merely to suggest areas of concern. We also refer readers to GBNEP's Data Inventory, which discusses problems of acquiring and using data about the bay across agencies (Ward and Armstrong, forthcoming).

We think that one of the most problematic aspects of managing Galveston Bay is ensuring both that agencies are willing to share their information and that they can do so. Assuming (counterfactually, in our experience) that they are willing to share, what will it take to make this possible?

1. Agreement among agencies about unique identifiers. EPA NPDES permit numbers and TWC permit numbers differ, names and addresses of facilities appear in different forms across and even within agencies, counties have different abbreviations and are sometimes included and sometimes not, effluent parameters have different abbreviations—the list of identifiers that should be comparable across all databases is long, but the list that are comparable is short. EPA has worked on this problem, partly as an outgrowth of the Congressional mandate to make the Toxic Release Inventory available to the public in electronic form. Facility ID numbers are one useful means. For different kinds of information, TWC consistently uses water segment numbers but other agencies do not.
2. Interconnectivity and interoperability. These two words are a fancy way of saying that all agencies' hardware and software should be able to "talk to" that of other agencies.
3. "Help" files. These files should be designed to provide background to users on how data were collected, including sampling technique and measurement protocol.
4. Flexible database structures. Right now, many agencies store their data in one form and one form only; that is, the one required by some other agency to which they report. It is impossible to imagine in advance all the different ways that data may someday be useful; therefore it is imperative to store it in the most flexible possible structures. Storing data in "report format"—that is, embedded in a set of formatting commands from which they cannot be extracted—should be a thing of the past.

The Texas Department of Information Resources (DIR) was established in 1989 to assist agencies in managing information, ensure they develop required information management plans, and coordinate purchases of hardware and software. DIR is addressing these four issues, attempting to develop data standards as well as hardware and software standards. DIR is also focusing its

attention on Geographical Information Systems (GIS), a kind of database that can be expressed on a map as well as in tables. Fully developed, this kind of database would allow staff in an agency to highlight Galveston Bay and retrieve anything from wetland acreage to fish catch over all years covered.

DIR is moving slowly on standards development, in part because the state would pay a high penalty if it developed standards incompatible with the as-yet-incomplete federal data standards. Meanwhile, agencies must go forward somehow, and GBNEP in particular needs some means for sharing data among agencies. One means for doing so is COMPAS (Coastal Oceanographic Mapping, Planning, and Analysis System) being developed by NOAA with a special pilot project for Texas. COMPAS is mentioned several times throughout this report, which also uses data drawn from it although provided by the various agencies. COMPAS is only useful on one platform—Apple Macintosh—and suffers from a focus on regulatory data to the exclusion of important social, economic, and political information, but it marks a good start. We should note that a NOAA programmer spent several hundred hours transforming the self-reporting water quality data from TWC into a form flexible enough for use in COMPAS.

No amount of interagency coordination will work if agencies do not initially enter their data accurately and sensibly. We had hoped, for example, to test a rumor we heard repeatedly; namely, that some water quality permits have been renewed several times without updating the effluent criteria, so that some facilities are meeting standards that are decades old. We were unable to do so because of the way in which the data were stored. We were also surprised to find that nearly 200 less municipal facilities were permitted in 1991 than in 1990 according to TWC's annual water quality report. When we called the agency to determine why, we discovered that unrenewed permits do not always show up in that tally (accounting for the apparent discrepancy: many permit renewals are on hold pending implementation of S.B. 818) and that it is difficult to discover from the data in their present form when the original permit was issued or renewed. We do not mean to pick on TWC; indeed, their data are in better shape than many of the other agencies with whom we worked. If one of the better agencies exhibits these problems, it will be difficult to share information.

Another important consideration in data management is, or should be, citizen access. Although we certainly regard ourselves as citizens, we identified ourselves to all agencies as conducting the study for GBNEP. We discovered agencies reluctant to provide their own governing statutes and regulations in electronic form because the information "isn't public"! We have documented elsewhere in this report our difficulties in merging data available only in a particular database program otherwise not in use. We encountered surprising difficulties and long delays in acquiring what we would regard as basic information.

Citizens should not have to go through these kinds of contortions to ask questions of or about their agencies. Our philosophy is that an agency should virtually never have to charge citizens for "programming" to provide data in requested form, because the questions citizens ask are the very same ones the agency should

be asking in order to manage itself properly. For example, does it not seem reasonable that TWC might try to see what would happen if they changed their "significant noncompliance" criteria marginally as we did (see Table 4-3)? Similarly, it should not come as a surprise to the relevant agencies that citizens want to know whether comments on Section 404 permits result in reduced disturbance of wetlands.

Finally, we are concerned that EPA appears to be requiring GBNEP to focus on sharing of monitoring data. We see monitoring as only one component of a larger effort and, indeed, one of the more problematic, given the agencies' legitimate concerns about different sampling protocols and analytic methods. We think that agencies would be at least as well-served if they could share information about such non-monitoring issues as emerging problems, proposed new federal regulations, a recent newspaper expose, a major permit application that will affect everyone, or the Corps' proposed streamlined review procedures.

In selecting an institutional mechanism for managing the bay, we urge policymakers to consider this issue of information coordination carefully. Without it, no institution can succeed, and it will be of particular importance if the chosen institution is some kind of coordinating body rather than a single unified agency. The phrase "knowledge is power" is a cliché but nonetheless true. It is critical that we ensure that the new agency is not disempowered from the outset by needless neglect of its information needs.

CONCLUSION

One of the primary tasks facing Texas is selecting an appropriate institute for managing Galveston Bay once the CCMP is written. In other eras, the report once written would simply have sat on a shelf, and without public support this could happen again. The resources we have mentioned—citizens groups, river authorities, and local governments—offer one means for ensuring that the CCMP becomes a reality. Mobilizing these resources is itself a resource-intensive task, however. Local governments especially are difficult to penetrate and fragmented, so that working with them requires constant vigilance. Their ability to derail the CCMP is so great, however, that working with them now remains of utmost importance.

Obstacles to implementing the CCMP are easy to list; readers can doubtless think of many we have not mentioned here. We have focused on four: absence of information in a form compelling to the public, unfavorable political climate, diffuse nature of remaining environmental problems, and contradictory agency mandates. No agency can do much about the unfavorable political climate, although presenting information in a compelling form may help people to understand and even support environmental protection of Galveston Bay. Similarly, the diffuse nature of many environmental problems cannot be resolved by any agency action, being built into the nature of the problems themselves. Yet agencies and legislatures can seek out alternative forms of regulation beyond command-and-control that use individuals' own motivations to elicit desired

environmentally sound behaviors. Finally, conflicting agency mandates can only be removed by the Legislature, which is unlikely to do so.

These obstacles, although pervasive and perhaps depressing, can help us think systematically about the kind of institution necessary for managing the bay. Our review of the advantages and disadvantages of several alternatives suggests that no single institution is perfectly suited to the complexities of managing Galveston Bay. However, we can see that no institution can succeed unless it has some power to require existing agencies to act in accord with its plan or directives; without such power, we simply continue the present fragmented and uncoordinated system. We can also see that no institution will be able to win such authority unless the other agencies and governmental units agree to work with it; thus some kind of inclusive governing mechanism similar to the several representative bodies within GBNEP will be required. As we noted in chapter 13, we are looking for a mechanism that combines the openness and comprehensiveness of the CCMP process with the authoritativeness of the CZM. An independent authority appears to fill these requirements the best.

Could such an entity overcome the obstacles that we have described and mobilize the resources? Much would depend, of course, on the legislative mandate and authority. However, such an independent authority would start with a great advantage: it would not have conflicting mandates, but instead would have a single clear goal—to protect the environment of Galveston Bay. To the extent that other agencies' actions were required to be consistent with the CCMP and/or CZM, therefore, environmental goals would be given priority. With that advantage, the entity could easily work with other agencies to develop economic incentives to replace or supplement command-and-control regulations; it could also devote resources to ensuring that the public receives the information it needs in a useful and usable form. On the other side, a single entity offers the public (and other agencies, including local governments and river authorities) a single place to go to obtain information—about rules and regulations, about funding, about the economic value of environmental protection, about volunteering to monitor water quality, about anything to do with Galveston Bay. Such an entity can form coordinating committees, develop expertise in working with local governments, and develop information especially geared to particular publics or to river authorities because it has a comprehensive but clear mandate. Finally, such an entity might be able to work with DIR and other agencies to develop a sensible and useful data management system.

In short, some kind of coordinating authority offers the best hope for implementing the CCMP and overcoming obstacles we have identified. Clearly, a particular institutional arrangement is not a panacea; it is an enabling mechanism rather than the answer to all problems. The Legislature would have to provide the authority with adequate resources and appropriate powers; agencies would have to cooperate with it. By creating a new entity, we may overcome some of the public's distrust of existing governmental institutions, and generate the excitement and enthusiasm without which the CCMP will follow earlier plans for coordinated environmental management onto the library shelf of history.

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